NOTES.

THE Atlantic has not yet been spanned by aircraft, although two aeroplanes are reported as ready for the eastern flight, and at present are only waiting quieter and more favourable conditions in mid-Atlantic. Towards the close of last week much snow fell at St. John's, Newfoundland, rendering a start at that time impossible, but the weather conditions had become favourable for landing over the British Isles, and have continued so for some days, the weather during Easter being remarkably fine and clear. The *Times* for the early days of the present week shows by the bulletins of the weather conditions along the Atlantic course issued by the Air Ministry that the barometric pressure has been very high both over the British Isles and in Newfoundland; but, although the weather is fine and the winds are light, there is much fog over Newfoundland, extending eastward so far as 43° W. longitude. In central Atlantic the barometric pressure is lower than on either side, and the fog, together with the winds, "constitute unfavourable conditions for the flight." If the Air Ministry intends to say when the conditions in mid-Atlantic are favourable—and from the daily bulletins given there is an inference that it does—the Ministry undertakes a great responsibility. It commonly happens that with similar weather conditions to those now prevailing on either side of the Atlantic storm-areas are developed in mid-Atlantic, and follow a more northerly track than usual, drifting towards Greenland or Iceland. Before a start is made under present conditions it would, therefore, be worth while to consider the advantage of following a fairly southerly route, striking northwards on approaching the eastern side of the Atlantic. This would probably lengthen the distance somewhat, but it might lessen the chance of falling in with a storm.

A COPY of the report of the secretary of the Smithsonian Institution of Washington for the year ending June 30, 1918, has been received. From it we learn that at the suggestion of the National Advisory Committee for Aeronautics the U.S. Council of National Defence appointed a committee, now known as the Aircraft Board, to consider all questions of aircraft production and to make recommendations to the military Departments for the production and purchase of aircraft and aircraft appliances. The experimental laboratory of the Advisory Committee has been erected at Langley Field, near Hampton, Va. The original Langley man-carrying flying machine, after several successful flights, is now exhibited in the U.S. National Museum. This machine is the first heavier-than-air man-carrying machine constructed, although it did not have a successful flight until more than ten years after its construction. The machine confirms the claim that the late Prof. Langley was the first to design and build a heavier-than-air machine capable of carrying a man in flight. The report points out also that the institution's researches and explorations were limited greatly during the year under review by war conditions. There was, naturally, unusual activity by members of the scientific staff in investigations related to Army and Navy operations. Several biological and ethnological expeditions have been held in abeyance, although some already in the field have continued in operation on a limited scale.

LAST November the London Section of the Society of Chemical Industry invited M. Paul Kestner, the president of the Société de Chimie Industrielle, to deliver an address in London, and advantage was taken of this occasion to inquire whether it was possible to promote some co-operation between French and English chemists. M. Kestner, with characteristic public spirit, has during the last few months taken energetic steps to bring this about, and the recent conference held in Paris marks an important advance. Among those taking part in the conference were Prof. Chavanne (Belgium), Profs. Moureu and Matignon, M. Kestner, and M. Poulenc (France), Senator Paterno and Dr. Pomilio (Italy), Mr. Henry Wigglesworth, Col. Norris, and Dr. Cottrell (United States), and Sir William Pope, Prof. Louis, and Mr. Chaston Chapman (Great Britain). It was decided to form an inter-Allied confederation for pure and applied chemistry which should organise permanent co-operation between the various countries, and co-ordinate scientific and technical knowledge as well as contribute to the advancement of chemistry in its fullest extent. The inter-Allied council is to consist at the moment of six representatives from each of the nations mentioned above. The first meeting will be held in London on July 15–18, when the inter-Allied council will be the guests of the Society of Chemical Industry, the annual meeting of which then takes place. For the time being the secretary of the inter-Allied federation will be M. Jean Gerard, 49 rue des Mathurins, Paris. Particulars of the London meeting can be obtained in due course from Dr. Stephen Miall, 28 Belsize Grove, N.W.3.

ON April 14 the Board of Agriculture and Fisheries was notified that a dog suspected to be suffering from rabies had been killed at Byfleet, Surrey. Post-mortem investigation proved that the dog was rabid. It had wandered from a house in Ealing on April 11, and during its three days' wandering is stated to have bitten five persons and several dogs. Two or three further cases of suspected rabies have since been reported in the London area. In consequence, the Board has made an Order prescribing the muzzling of dogs with wire-muzzles over an area which includes the whole of the counties of London and of Middlesex, nearly the whole of Surrey, and portions of Buckinghamshire, Hertfordshire, Berkshire, and Hampshire. It is to be hoped the necessary muzzles will quickly be forthcoming (at the moment of writing they are difficult to procure), that the authorities will rigorously enforce the Order, and that the public will support their action. It may be recalled that the similar Order by Mr. Walter Long in 1896–97 ensured complete immunity from rabies in this country for more than twenty years. Since rabies reappeared in Devon and Cornwall last September 150 cases have been reported.

AT the annual meeting of the Society of Glass Technology, held on April 16 in the Applied Science Department of the University of Sheffield, Mr. W. F. J. Wood, president of the society, referred in his presidential address to the Research Association that has been formed in the glass industry. A provisional committee has been appointed, and at an early date all manufacturers in the industry will be invited to join the Glass Research Association. Substantial promises have already been received, and it is felt that the scheme will be a decided success. Sir Frank Heath, Secretary of the Department of Scientific and Industrial Research, also addressed the meeting. He pointed out that the glass industry had been engaging the anxious consideration of the Government as much as, if not more than, any industry in the country since the war began. During the war the Department had been enabled to help the industry in many ways, and would do so in the future. There was a great call from other industries besides that of glass for State aid in research. Research was insurance for knowledge, and he appealed to the Research Association to get the best men possible for their work. Mr.

S. N. Jenkinson has been elected president of the society for the ensuing year.

The annual meeting of the Society of Chemical Industry will be held in London on July 15–18. The King has consented to act as patron and the Prince of Wales as vice-patron. The opening meeting will be held at the Mansion House on July 15, when the Lord Mayor will extend the civic welcome, and Prof. Henry Louis will deliver his presidential address. Arrangements have been made for the delivery of an address by Sir William J. Pope, and for the holding of conferences on Empire sugar production, the leather, dye, and fermentation industries, and power plants in chemical works. Further particulars will be announced later.

On Tuesday next, April 29, Prof. A. Keith will give the first of a course of four lectures at the Royal Institution on British Ethnology: The People of Wales and Ireland. On Thursday, May 1, Dr. H. S. Hele-Shaw will give the first of two lectures on clutches. The Friday evening discourse on May 2 will be delivered by Prof. J. W. Nicholson on energy distribution in spectra; and on May 9 by Sir George Macartney on Chinese Turkestan: Past and Present. On Saturday, May 3, Prof. H. S. Foxwell will give the first of two lectures on chapters in the psychology of industry.

The spring and autumn meetings of the Institute of Metals will be held, respectively, in London on May 19 and in Sheffield on September 24–25. At the London meeting Prof. F. Soddy will deliver the ninth annual May lecture on "Radio-activity," for which cards of invitation may be obtained from Mr. G. Shaw Scott, 36 Victoria Street, S.W.1, upon receipt of a stamped and addressed envelope. The Sheffield meeting will be the first provincial gathering of the institute to be held since the war. The headquarters will be at the University of Sheffield.

With the view of giving archæologists and other people interested in the question of the antiquity of the human race an opportunity of examining some of the flaked flints found in the detritus bed beneath the Red Crag of Suffolk, Mr. J. Reid Moir has, with the co-operation of the council of the Royal Anthropological Institute, arranged for a good series of these specimens to be exhibited in the rooms of the institute, 50 Great Russell Street, W.C.1, for one month from Friday, May 2.

The subject for the Jacksonian prize of the Royal College of Surgeons of England for 1920 is "The Results and Treatment of Gunshot Injuries of the Blood-vessels." The subject for the next Triennial prize of the college is "The Anatomy, Morphology, and Age-changes of Cervical Ribs in Man, including a Description of the Associated Ligaments, Muscles, Blood-vessels, and Nerves."

We regret to see the announcement of the death of Mr. D. Rintoul, head of the physics department of Clifton College since 1885, when he succeeded the late Prof. A. M. Worthington in that post.

The life of the Rev. Stephen Hales, F.R.S. (1677–1761), is reviewed in an interesting article by Prof. F. Smith in the *Veterinary Review* (No. 1, vol. iii., 1919). Hales's work on experimental physiology, animal and vegetable, is well known, but his equally important researches in hygiene are apt to be overlooked. He devoted years of his life to the study of ventilation, and introduced, though not without considerable opposition, mechanical ventilation into prisons and ships. He also dealt with the ventilation of mines and hospitals, and noted that wounds healed better in tents with good ventilation than in foul air.

Acute infective polyneuritis is the subject of an article by Sir John Rose Bradford, E. F. Bashford, and J. A. Wilson in the *Quarterly Journal of Medicine* (vol. xii., Nos. 45 and 46). The disease is apparently a newly recognised one, characterised by generalised palsy of peculiar character. The clinical features and morbid anatomy of the disease are fully described. The disease has been transmitted to monkeys by inoculation of human spinal cord under the membrane of the brain. Very minute coccoid bodies are present in the spinal cord, and by the Noguchi culture method cultivations of a similar micro-organism were obtained. The organism measures 0·2μ–0·5μ in diameter, is rounded, oval, or kidney-shaped, and is difficult to stain. By dark-ground illumination it is merely a minute, highly refractile, undifferentiated body. The cultivations inoculated into monkeys reproduce the disease clinically and pathologically.

The annual report of the Scottish Marine Biological Association shows that, notwithstanding the absence of the superintendent, Lieut. R. Elmhirst, on naval service, the marine station at Millport continues to contribute valuable researches in several branches of marine biology. Dr. J. F. Gemmill has made progress with his study of the development of Asteroids, and has succeeded in rearing crosses between *Solaster endeca* and *Crossaster papposus* up to the commencement of metamorphosis. He has also reared and studied the early development stages of several anemones. Other researches mentioned in the report are those of Mr. J. S. Sharpe on calcium metabolism in molluscs, and on the action of guanidine on the neuro-myal system of decapod crustacea; of Mr. H. Leigh-Sharpe on *Calliobdella nodulifera*; and of Mr. James Dick on the medusæ of the Clyde. The usual educational work has been continued, the Nature-study classes for teachers being a successful feature.

We are glad to see that Australian ornithologists are paying increasing attention to the subject of the food of their native birds. In the January issue of the *Emu*, which has just reached us, Mr. Sidney Jackson comments on the inestimable benefits of the letter-winged kite (*Elanus scriptus*), which had established nesting colonies in the midst of an area of several hundred miles infested with millions of rats, on which they were feeding their young. Specimens of two species of these rodents were collected. The larger and more numerous was the long-haired rat (*Epimys longipilis*), the smaller the sordid rat (*E. sordidus*). The birds rested by day and hunted by night, when their prey came forth to feed. In the same issue Messrs. S. A. White and A. M. Morgan record the results of their examination of the stomachs of cormorants, which have lately been condemned on account of the supposed ravages they commit on food-fishes. They are able to show conclusively that the charges against these birds are absolutely without foundation, since no food-fishes were found, but only specimens of slow-moving species haunting weedy places, where their capture was easy.

In 1915 R. Dodge and F. G. Benedict, of the Nutrition Laboratory of the Carnegie Institution of Washington, published a volume entitled "Psychological Effects of Alcohol." In this book they recorded the results of an investigation upon the influence of alcohol on a number of physiological processes, including various reflexes and certain kinds of reaction-time, as well as other processes of more psychological interest, such as memorising and the speed of free associations. They tested the effects of doses of 30 c.c. and 45 c.c. of absolute alcohol in ten subjects, and found a general depreciation of function on the days on which alcohol had been administered. One of their subjects showed the injurious effect of the alcohol in far less measure than the rest, although it produced certain general effects, such as sleepiness and a feeling of intoxication, which might have led one to expect the experimental tests to show a lowering of function. Dr. Walter R. Miles has now published a second volume entitled "Effect of Alcohol on Psycho-physiological Functions" (Washington, 1919), which is entirely devoted to a more extensive study of this apparently resistant subject. Using precisely the same methods as Dodge and Benedict, and working in the same laboratory under the same general conditions, Dr. Miles obtained results agreeing fairly closely with the general average of the earlier investigation. In twenty-seven out of thirty sets of results the effect of the alcohol was to lessen the value of the subject's performance, and in eleven cases this depreciation amounted to as much as from 10 to 37 per cent. The anomalous results of the first investigation seem to have been due to the effect upon the average of one or two days on which the subject had done especially well after he had taken alcohol.

The remarkable richness of the flora of South-West China, especially in certain families, is illustrated by several papers by Prof. Bayley Balfour, W. W. Smith, and W. G. Craib which have recently appeared in the Transactions and Proceedings of the Botanical Society of Edinburgh (vol. xxvii., parts 2 and 3) and in the Notes from the Royal Botanic Garden, Edinburgh (vol. x.). The plants were collected mainly by Messrs. Forrest and Kingdon Ward. The place of honour is held by the Rhododendrons, in which genus fifty new species are described, including several from Upper Burma and Bhutan. There are also a number of new Primulas, some of which were collected in the Himalayas, a few striking autumn-flowering gentians, and two new genera of Gesneraceæ, as well as novelties in other families. Prof. Balfour also describes some interesting observations on Rhododendron seedlings, in which a juvenile character, the presence of an intense red colour, due to an anthocyanin pigment, on the undersurface of the leaf, persists for several years, and is gradually replaced by the peculiar hairiness which characterises the adult leaf. It is suggested that the change is correlated with a change in climatic relation. The young plant passes from a position in which its foliage is subject to the conditions of light, moisture, heat, and air-current belonging to a stratum at the soil-surface, to one some distance above the surface in which the same external factors operate in different intensity. Temperature and speeding-up of metabolism are prime considerations in the first environment, control of loss of water in the second. The anthocyanin development is an adaptation to the former, the hairy indumentum to the latter. Prof. Balfour also discusses, under the title "The Genus Nomocharis," a puzzling little group of lily-like plants from western China, which combine some of the characters of the true lilies and the fritillaries.

The Experimental and Research Station at Turner's Hill, Cheshunt, an offshoot from the Rothamsted Experimental Station, continues its good work for nurserymen and market-gardeners growing under glass. The manurial experiments have been continued on substantially the same lines as in previous years, and have given practically the same results; again it is shown that farmyard manure is an efficient manure for cucumbers, and cannot adequately be replaced either by hoofs or bone-meal. Tomatoes, on the other hand, require potassic fertilisers and not so much nitrogen; indeed, in the experiments nitrogenous fertilisers have actually reduced the crop. Phosphates also had less effect than had been anticipated. The results recall those obtained at the Woburn Fruit Farm in their somewhat unexpected nature, and they bring out the necessity for a detailed physiological study of the phenomena of fruiting. The work on partial sterilisation has been extended during the year. Mr. W. B. Randall placed at the disposal of the committee a sum of money enabling it to appoint a special investigator, Mrs. D. J. Matthews (Miss Isgrove), who is studying the effect of various substances on the noxious organisms of the soil. Hitherto no agent has been found to be quite so effective as steam, and it seems possible that a mixture of substances will be necessary, one to deal with animals and another with fungi. A beginning has also been made with the study of the Noctuid moth, *Hadena oleracea*, which has become a serious menace to the tomato-growing industry; during the current year this work is to be extended considerably. A remarkable phenomenon is the zig-zag nature of the curve showing the yields of tomatoes on successive rows of plants. The outside row, as might be expected, shows the highest yield; the other rows give alternately high and lower yields. It is difficult to account for these observations, but the differences are greater than are obtained by differences in manuring. The report is full of interest to the plant physiologist.

According to the Journal of the Franklin Institute for November, 1918, tests have been made to find the transmission factors for several slightly diffusive glasses for two kinds of illumination, viz. (1) a narrow beam of light perpendicular to the surface of the specimen, and (2) uniformly diffused light reaching the specimen from all directions above its plane, known as hemispherical illumination. The transmission-factor is, generally speaking, less for diffused (hemispherical) illumination than for the narrow beam of light. The transmission-factor of the glasses studied depends upon the position of the glass with respect to the source of light. For a narrow beam of light the transmission-factors are usually considerably greater when the rough surface faces the light than when the smooth surface is towards it. This is specially noticeable in ribbed glasses, but has not been noticed in etched glasses.

The two sections of *Science Abstracts* for 1918 are now completed by the issue of the index parts for physics and electrical engineering. The former section extends to 575, and the latter to 492, pages, of which 62 and 37 pages are occupied by the indexes. The number of abstracts in the two sections is 1283 and 886 respectively, which are both 25 per cent. less than those of three years ago. The average length of an abstract, which has for some years been greater in the electrical engineering than in the physics section, has in the three years increased in both sections by 3 per cent. So far as can be seen from a glance through the volumes, this appears to be due to a relatively small number of abstractors supplying long abstracts rather than to a general increase in length of all abstracts. The art of conveying information in a few concise and readable lines is acquired only by practice, and a little editorial admonition might lead to a considerable improvement. Every physicist and every electrical engineer anxious to keep abreast of the times owes much to *Science Abstracts*, for without it his knowledge of what has been done in enemy countries during the last five years would have been very fragmentary

Reference has already been made in our "Notes" to the Admiralty salvage operations during the war. An article in the *Engineer* for March 21 gives an account, with illustrations, of the submersible salvage pumps and engines employed in these operations. It is not always convenient to supply current from a salvage vessel, and in such cases the electric current for driving the pumps is supplied by an oil engine-driven dynamo. It is essential that the plant should be weatherproof and unaffected by sea-spray or rain. Although a dynamo which will withstand being submerged has not yet been produced, the oil-engines described in the article are capable of being covered with water without coming to any harm. The engine cannot, of course, work while submerged. The necessity for an engine of this kind arose in connection with the installation of centrifugal pumps on a wreck situated in tidal waters, which had, owing to unforeseen circumstances, to remain in position while the tide rose and completely submerged the plant. A number of these engines have been built at the Bedford works of Messrs. W. H. Allen, Son, and Co. Up to the present there are two standard sizes, one with two cylinders of 12 brake-horse-power, and the other having four cylinders giving from 46 to 50 brake-horse-power.

At the annual meeting of the Institute of Metals, held on March 25 and 26, the fourth report to the Corrosion Research Committee of the Institute of Metals was presented by Capt. Bengough and Dr. Hudson. The publication of this investigation, which is subsidised by the Department of Scientific and Industrial Research, has been considerably delayed owing to the request of the Admiralty that the results should not be made available during the war. The report is divided into three main parts. The first is devoted to the question of the nature of the attack which takes place when metals such as zinc, copper, and aluminium, and alloys such as 70:30 brass, corrode in neutral or nearly neutral liquids, *e.g.* distilled water and sea-water. The second section is devoted to the consideration of the behaviour of condenser tubes in similar liquids, and variations of behaviour in different samples of tubes of nominally the same composition. The third section is an attempt to set out in some detail a statement of the practical problems of corrosion in sea-water, which appear to the authors to be very different from what is usually supposed. A preliminary account is also given of experiments carried out with the object of testing an electrolytic process of protection and a pre-oxidising process designed for the same end. The authors express the view that corrosive attack on condenser-tubes is more diverse in character and complicated in nature than has been generally supposed. The first action is one of chemical oxidation, and secondary actions are of great importance. No one single remedy is likely to be found effective for all the different kinds of attack which occur in practice. The nature of the tube used and the protective measures chosen should be dependent on the particular set of conditions.

"Co-ordination of Research in Works and Laboratories" is the title of a paper by the late Mr. H. R. Constantine read before the Institution of Electrical Engineers on March 27. A scheme is outlined in which it is proposed to place under the direction of a central board all the laboratories attached to the universities, colleges, and training institutions of the country, as well as many experimental laboratories connected with private works. The board would keep full records of what each laboratory was doing, and receive all inquiries for research work to be done; it would keep a record of results published all the world over. Further, the board would be invested with power to order any laboratory to undertake certain research work, or to leave another research alone, or, indeed, to transfer, if considered advisable, part of its equipment or *personnel* to another laboratory. Finally, all discoveries would be communicated to the board, which would have power to dispose of them after consideration of the rights of the individual worker. If adopted, the scheme would apparently supersede the Industrial Research Associations established already in connection with the Department of Scientific and Industrial Research, which has had a grant of 1,000,000*l.* placed at its disposal by the Government, and has been for some time actively at work. It is also as well to point out that the research work carried on in universities and other teaching institutions is conducted not wholly for the sake of the results looked for, whether purely scientific or technical, but for the educational purpose of training students in method. Moreover, as repeatedly pointed out, the original researcher in connection with fundamental problems will not usually be willing to unfold his ideas to others, at any rate in their early stages, before they have been tested.

Among forthcoming books of science we notice the following:—"Problems of Fertilisation," Prof. F. R. Lillie (*Chicago: The University of Chicago Press; London: The Cambridge University Press*); "Influenza: A Modern Account of its Pathogenesis, Symptoms, Complications, Sequels, and Treatment upon Combined Specific and Non-specific Lines," Sir T. J. Horder (*Henry Frowde and Hodder and Stoughton*); a new edition, thoroughly revised and enlarged, of "Practical Physiological Chemistry," S. W. Cole, with an introduction by Dr. F. G. Hopkins (*Cambridge: W. Heffer and Sons, Ltd.*); "Commercial Forestry in Britain: Its Decline and Revival," E. P. Stebbing; "Conifers: A Key to their Identity and Converse," C. C. Rogers, illustrated; "Tin," G. M. Davies; "Manganese," A. H. Curtis; and new and revised editions of "Heredity," Prof. J. Arthur Thomson, illustrated, and "Hydrographical Surveying: A Description of the Means and Methods Employed in Constructing Marine Charts," the late Rear-Admiral Sir W. J. L. Wharton, revised and brought up to date by Admiral Sir Mostyn Field (*John Murray*); "A Woman Doctor: Mary Murdoch of Hull," H. Malleson, and "Advance in Co-Education," edited by A. Wood (*Sidgwick and Jackson*).

OUR ASTRONOMICAL COLUMN.

Changes on Jupiter.—Observers appear to be fairly well agreed on the character of the recent variations in some of the more prominent and durable of Jovian features. The Rev. T. E. R. Phillips, who has devoted much attention to Jupiter's appearance in recent years, says that the opposition of 1918–19 will be a memorable one. To his eye "the south tropical disturbance and the hollow in the southern belt have practically disappeared, but the red spot remains quite distinct on a night of good definition." The changes which have affected this particular region of the surface have been rapid and most remarkable. Mr. Phillips employs two instruments, one a 12½-in. reflector and the other an 8-in. refractor. He regards it as likely to afford much satisfaction to observers that the red spot continues to retain a definitely elliptical outline, for the obliteration of this familiar marking would be regarded as a great loss by all students of the planet. That this object may at some future time regain its former (1878–80) conspicuous aspect is quite possible, and it should be attentively watched for changes of both shape and motion.